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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/322,321	05/28/1999	TONIA MORRIS	042390.P6888	7825

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EXAMINER

GENCO, BRIAN C

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/322,321

Applicant(s)

MORRIS ET AL.

Examiner

Brian C Genco

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Applicant's amendment filed April 29, 2003 has overcome the 35 U.S.C. 102(b) rejection of claims 1-16 and the 35 U.S.C. 103(a) rejection of claims 17-22.

Applicant's arguments with respect to claims 23 and 27 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the process of using only one reset bit in the reset shift register with the longest integration time as claimed in claims 26 and 30 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Examiner notes that while Applicant discloses a timing diagram, Fig. 4, wherein it is shown that the blue reset shift register only has one reset bit, no figures are provided showing how the charge is integrated or the process of correlated sampling described in brief on page 15, line 19 – page 16 line 2.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to because Fig. 4 shows a timing diagram for the operation of the present invention, however it is confusing. Examiner notes that the timing for the red and green pixels is shown at time n and that for the blue pixels at time $n + 1$. Examiner requests that Applicant edit this figure so as to show the timing of all pixels at the same time, namely time n . A proposed drawing correction or corrected drawings are required in reply to the Office action to

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avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following: As is noted below, on page 15, line 19 – page 16 line 2 Applicant discloses performing correlated double sampling (CDS) using two reset bits for the red and green pixels. Further, Applicant discloses performing correlated sampling (CS) for the blue pixel using only one reset bit. Examiner notes that Applicant makes a specific distinction between performing CDS for the red and green pixels and performing CS for the blue pixel, however there is no description of what correlated sampling entails. Examiner requests that Applicant clarify what and how correlated sampling is performed using only one reset bit.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 26 and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Examiner notes that in

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claims 26 and 30 Applicant asserts that only one reset is needed for the third reset shift register, which in light of the specification is in reference to the blue reset shift register as described on page 15, line 19 – page 16 line 2. It is not clear as currently described in the specification how one would be able to perform correlated double sampling (CDS) using only one reset bit. As such, Examiner notes that Applicant makes a distinction between performing CDS for the red and green pixels and performing correlated sampling for the blue pixel, however there is no description of what correlated sampling entails. Examiner requests that clarification of what and how correlated sampling is preformed using only one reset bit is preformed.

Claims 23 and 27 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Generating a pair of read bits is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Examiner asserts that if only a single read bit is generated then correlated double sampling cannot occur since, as one skilled in the art would recognize, it is essential to read out signal plus noise as well as the noise in order to perform correlated double sampling.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 23-25 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 6,175,383 to Yadid-Pecht et al) in view of (USPN 6,046,444 to Afghahi) in view of (USPN 5,452,004 to Roberts).

In regards to claim 23 Yadid-Pecht discloses an integrated circuit comprising:

a pixel array (e.g., element 64);

a first reset shift register having a plurality of outputs, each output being coupled to control a reset of some of the sensor elements that are in a respective one of the rows of the array (e.g., element 82 of Fig. 4);

a wordline shift register having a plurality of outputs, each output being coupled to control a readout of the sensor elements that are in a respective one of the rows of the array (e.g., element 70 of Fig. 4).

Yadid-Pecht does not explicitly disclose nor preclude a color sensor array or the claimed control logic.

It is extremely well known in the art to use color filters with image sensors in order to produce color images. Official notice is taken. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have added a color filter to Yadid-Pecht's invention in order to produce color images.

It is further extremely well known in the art to provide correlated double sampling of pixels in order to eliminate reset noise. Afghahi discloses generating a pair of reset bits and a pair of read bits wherein one of the read bits is situated between the two reset bits in order to perform correlated double sampling (e.g., column 3, line 60 – column 4, line 36; Fig. 3).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have added the control logic disclosed by Afghahi in order to perform correlated double sampling and thus eliminate reset noise.

Still further it is known to perform a rolling reset in order to be able to vary the exposure time of pixels for both high intensity light sources as well as low intensity light sources. Roberts discloses performing a rolling reset wherein the first reset bit is one or more rows ahead of the read bit (e.g., column 7, line 28 – column 8, line 20). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have added Roberts' rolling reset feature in order to enable proper exposure time under a variety of light sources as well as to enable windowing of image sensor sections.

Roberts does not disclose having a second reset bit one or more rows behind the read bit as disclosed by Afghahi, however it would have been obvious to one of ordinary skill in the art to have added this feature of correlated double sampling to the rolling reset feature. Examiner notes that the second reset bit must be at least one row behind the read bit, otherwise you would reset your integrated image signal.

In regards to claim 24 it is extremely well known to use the Bayer color filter pattern in order to produce images with higher green sensitivity and thus having higher sensitivity to the human eye. Official notice is taken. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have made the color filter a Bayer color filter in order to produce images with higher green sensitivity and thus having higher sensitivity to the human eye.

In regards to claim 25 see examines notes on the above rejections. Note that Yadid-Pecht discloses having only one reset metal line for each row.

In regards to claims 27-29 see examines notes on the above rejections.

Claims 26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 6,175,383 to Yadid-Pecht et al) in view of (USPN 6,046,444 to Afghahi) in view of (USPN 5,452,004 to Roberts) in further view of (USPN 4,709,259 to Suzuki) in further view of (USPN 5,541,645 to Davis).

None of Yadid-Pecht, Afghahi, nor Roberts disclose having a third reset shift register. Suzuki discloses having separate readout registers in order to allow color specific exposure settings as opposed to Yadid-Pecht's pixel specific reset and readout structure in order to obtain a color image signal with increased dynamic range(e.g., Fig. 2; column 2, lines 17-21). Therefore it would have been obvious to have made Yadid-Pecht's pixel specific reset and readout structure color specific in order to increase dynamic range of a color image. As such there would be one reset register for each color. Further it is known in the art that in conventional lighting the blue color typically has the lowest intensity thus has the longest integration time. Davis discloses that since this is the case, in order to have a time efficient image sensor, and minimize dead time one would only want to reset the blue color once (e.g., column 5, line 26 – column 6, line 7). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have only had one reset for the blue reset register, or third reset register, in order to minimize dead time and thus have a time efficient image sensor.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

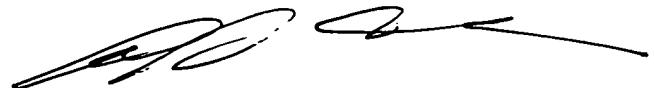
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 703-305-7881 or by fax at 703-746-8325. The examiner can normally be reached on Monday thru Friday 8:00am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center 2600 customer service office whose telephone number is 703-306-0377.

June 5, 2003

Brian C Genco
Examiner
Art Unit 2615



ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600